

**TWO NEW SPECIES OF *TREMEX* (HYMENOPTERA: SIRICIDAE)
REARED FROM *CASTANOPSIS* AND *SYMPLOCOS* IN JAPAN**

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Abstract.—Two new species of woodwasps from Japan, *Tremex sudajii* and *Tremex kurokivorus*, are described and illustrated. A key is provided for the nine Japanese species of *Tremex*. *Tremex sudajii* emerged from *Castanopsis cuspidata sieboldii* Nakai (Fagaceae) and *T. kurokivorus* emerged from *Symplocos lucida nakaharai* Makino (Symplocaceae).

Key Words: Symphyta, Siricidae, *Tremex*, food plants

I received two female specimens of *Tremex* Jurine from E. Makihara of the Forestry and Forest Products Research Institute, Tsukuba City. These emerged from wood of *Castanopsis cuspidata sieboldii* Nakai and *Symplocos lucida nakaharai* Makino in Anami-oshima and Okinoerabujima, Kagoshima Prefecture, Kyushu, Japan. *Tremex* includes about 31 world species, most of which occur in eastern Asia. Seven species are known in Japan. After comparison of the two females with the other Japanese species and the available literature on Asian *Tremex*, I concluded that these specimens represent two new species, and I describe them below. They can be separated from other Japanese species by the following key.

**KEY TO FEMALES OF JAPANESE SPECIES
OF *TREMEX***

1. Antenna entirely black or black with apical half white; apical half of forewing infusate
Antenna entirely fulvous or brownish black to black, sometimes basal 3-4 segments reddish yellow; forewing yellowish hyaline
2. Apical half of antenna white; basal half of fore- and hind wings hyaline; 2nd to 3rd abdominal tergites yellowish white; legs

- black with basal halves of tibiae, entire basitarsi, and 5th tarsal segments yellowish white; 1st to last abdominal tergites polished *apicalis* Matsumura
- Antenna entirely black; basal ¼ and apical half of fore- and hind wings infusate (Fig. 1); abdominal tergites entirely black (Fig. 1); legs entirely black; 2nd to 5th abdominal tergites distinctly, closely, and reticulately sculptured, matt (Fig. 9a), 6th to last tergites sparsely punctured (Fig. 9b) *sudajii*, n. sp.
3. Pronotum long, medially nearly as long as ocello-occipital line (OCL) (ratio about 1.0:1.0) 4
 - Pronotum short, medially shorter than OCL (ratio about 1.0:1.3-1.6) 5
 4. Antenna brownish black; 8th abdominal tergite nearly as long as three preceding tergites combined; precornal basin nearly as long as broad *longicollis* (Konow)
 - Antenna fulvous; 8th abdominal tergite nearly as long as four preceding tergites combined; precornal basin broader than long *contractus* Maa
 5. Anterior portion of 8th tergite reddish yellow or yellow with posterior black; anterior ¼ or ⅓ of 2nd tergite yellow and posterior black 6
 - Eighth tergite with black band in middle (sometimes posterior half with two reddish yellow maculae or posterior half black); 2nd tergite entirely reddish yellow 7
 6. Anterior half of 8th tergite reddish yellow or yellow with black posteriorly; 3rd anten-



Fig. 1. *Tremex sudajii*, holotype, dorsal view.

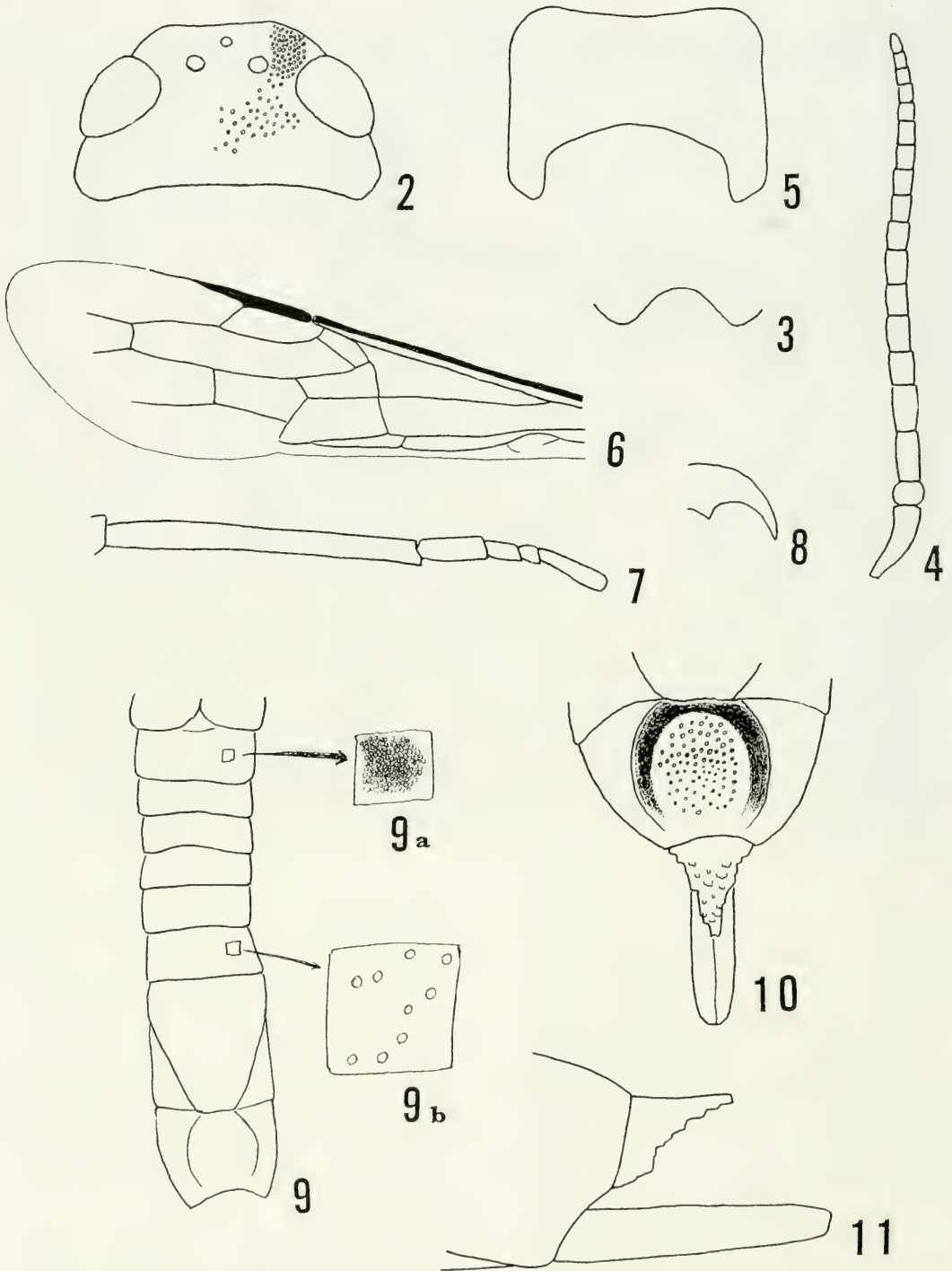
- nal segment slightly shorter than 4th (ratio about 1.0:1.2); pedicel slightly broader than long *okinawensis* Togashi
- Anterior 1/3 of 8th tergite yellow and posterior 2/3 black; 3rd antennal segment as long as 4th (ratio about 1.0:1.0) (Fig. 15); pedicel longer than broad *kurokivorus*, n. sp.
- 7. Eighth tergite shorter than combined lengths of three preceding tergites combined (ratio. about 1.0:1.2); 1st tergite entirely black *kaedei* Togashi
- Eighth tergite about as long as three preceding tergites combined; lateral sides of 1st tergite with reddish yellow maculae 8
- 8. Mesoscutellum black; middle segments of antenna longer than broad; sheath shorter than basal plate (ratio about 1.0:1.5) *fuscicornis* (Fabricius)
- Mesoscutellum reddish brown; middle segments of antenna slightly broader than

long; sheath much shorter than basal plate (ratio about 1.0:2.7) *nakanei* Takeuchi

Tremex sudajii Togashi, new species
(Figs. 1–11)

Female.—Length 18 mm. Body including antenna and legs entirely black. Apical half and basal 1/4 of fore- and hind wings infuscate, central portion hyaline (Fig. 1); stigma and veins dark brown to black.

Head: Transverse, slightly enlarged behind eyes (Fig. 2); interocellar, postocellar, and lateral furrows indistinct; OOL:POL:OCL = 0.7:1.0:2.6; postocellar area slightly raised; frontal area nearly flattened; antenno-ocular distance



Figs. 2-11. *Tremex sudajii*, holotype. 2, Head, dorsal view. 3, Clypeus, front view. 4, Antenna, lateral view. 5, Pronotum, dorsal view. 6, Forewing. 7, Hind tarsus, lateral view. 8, Tarsal claw, lateral view. 9, Abdominal tergites, dorsal view. 9a, Sculpture on 2nd to 5th tergites. 9b, Punctures on 6th to 7th tergites. 10, Precornal basin, dorsal view. 11, Sheath, lateral view.

shorter than distance between antennal sockets (ratio about 1.0:5.5); anterior margin of clypeus circularly emarginated (Fig. 3). Antenna 18-segmented (Fig. 4); shorter than head and thorax combined (ratio about 1.0:1.2); 3rd segment nearly as long as 4th; 5th to last segments each shorter than 4th (ratio about 1.0:0.4–0.6).

Thorax: Pronotum long, its midlength nearly as long as OCL (ratio about 1.0:1.0) (see Figs. 2, 5). Venation of forewing as in Fig. 6. Tarsal claws with small inner tooth (Fig. 8); hind basitarsus longer than following 4 segments combined (ratio about 1.6:1.0) (Fig. 7).

Abdomen: Eighth tergite nearly as long as three preceding tergites combined (ratio about 1.0:1.0) (Fig. 9); precornal basin nearly as long as broad (Fig. 10); central portion of precornal basin raised; cornus as in Figs. 10, 11; sheath shorter than basal plate (ratio about 1.0:1.8).

Punctuation: Vertex distinctly and sparsely punctured, interspaces between punctures impunctate, shining (Fig. 2); frontal area, supraclypeal area inner orbits, clypeus, malar space, and gena distinctly and closely punctured, matt (Fig. 2); labrum nearly impunctate; thorax distinctly and closely punctured, matt. First abdominal tergite shallowly, closely, and reticulately sculptured, matt; 2nd to 4th abdominal tergites distinctly, closely, and reticulately sculptured (Fig. 9a), matt; posterior half of 5th tergite and 6th to last tergites distinctly and sparsely punctured, interspaces between punctures nearly impunctate, shining (Fig. 9b); central portion of precornal basin distinctly and closely punctured (Fig. 10).

Male.—Unknown.

Food plant.—*Castanopsis cuspidata* Scholtzky var. *sieboldi* Nakai (Japanese name: sudajii) (Dicotyledoneae: Fagaceae).

Distribution.—Japan (Kagoshima Prefecture, Amami-oshima).

Holotype.—Female, 18.VIII.2004, emerged from timber of *Castanopsis cuspidata* var. *sieboldi*, Mt. Aburai, Amami-oshima, Kagoshima Pref., Kyushu, Japan; H. Makihara leg. Deposited in the National Science Museum (Nat. Hist.), Tokyo.

Etymology.—The species name is a noun in apposition, derived from the Japanese name of the food plant.

Remarks.—This species can be separated from the other Japanese species of *Tremex* by the preceding key. In the key by Maa (1949), *T. sudajii* is allied to *T. insularis* Smith, *T. alchymista* Mocsáry, and *T. magus* (Fabricius), but it is distinguished from them by the entirely black antenna; the other species have the apical halves of the antenna whitish or yellow. Also, this species does not agree with those described from Korea (Lee et al. 1998) and China (Xiao and Wu 1983).

In Japan, *T. sudajii* is allied to *T. apicalis*, but *T. sudajii* is distinguished by the black antenna (apical half white in *T. apicalis*), by the basal quarter of the forewing infuscate (basal half of fore- and hind wings hyaline in *T. apicalis*), and by the black legs (basal half of tibiae and basitarsi and 5th tarsal segments yellowish white in *T. apicalis*). From *T. longicollis*, *T. sudajii* is distinguished by the 18-segmented antenna (14- to 16-segmented in *T. longicollis*), by the subequal 3rd and 4th antennal segments (3rd segment shorter than 4th, ratio about 1.0:1.3, in *T. longicollis*), and by the sculpture on the 2nd to 4th tergites (impunctate in *T. longicollis*).

Tremex kurokivorus Togashi, new species (Figs. 12–21)

Female.—Length including cornus 20 mm. Head including antenna reddish brown with following dark brown to black: two small maculae behind posterior ocellus (Fig. 13), clypeus, labrum, mandible, lower 1/5 of inner orbit, and maxillary and labial palpi. Thorax black

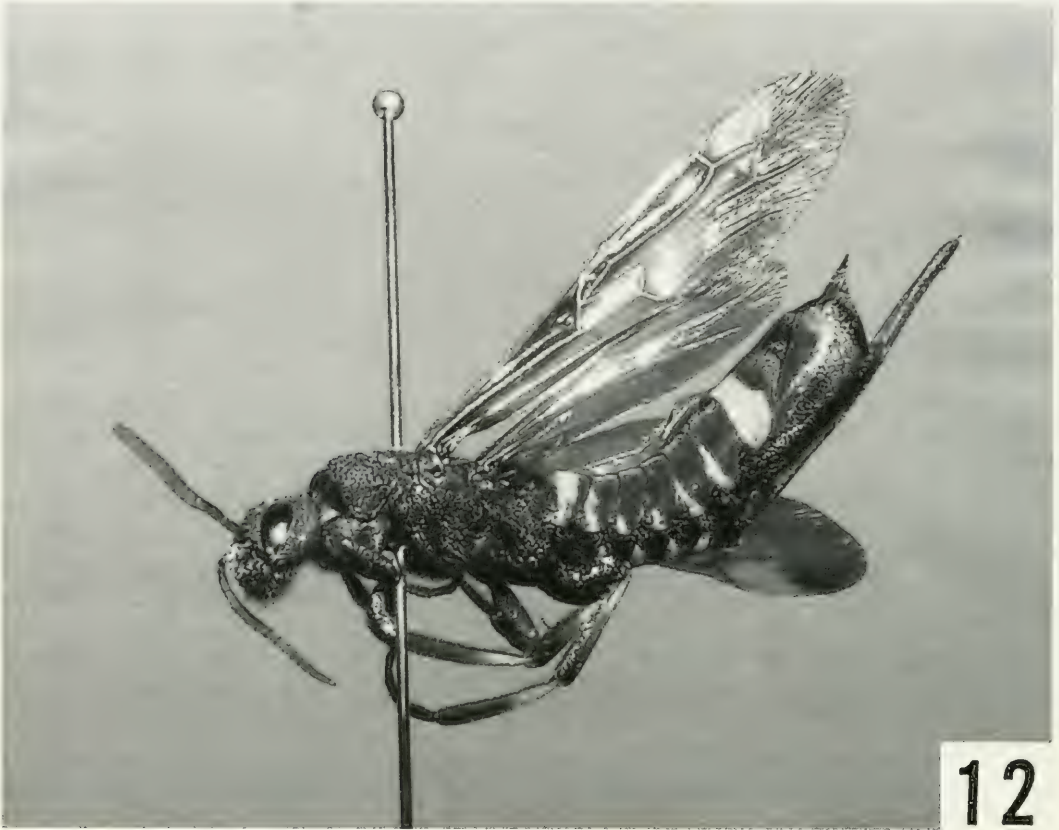
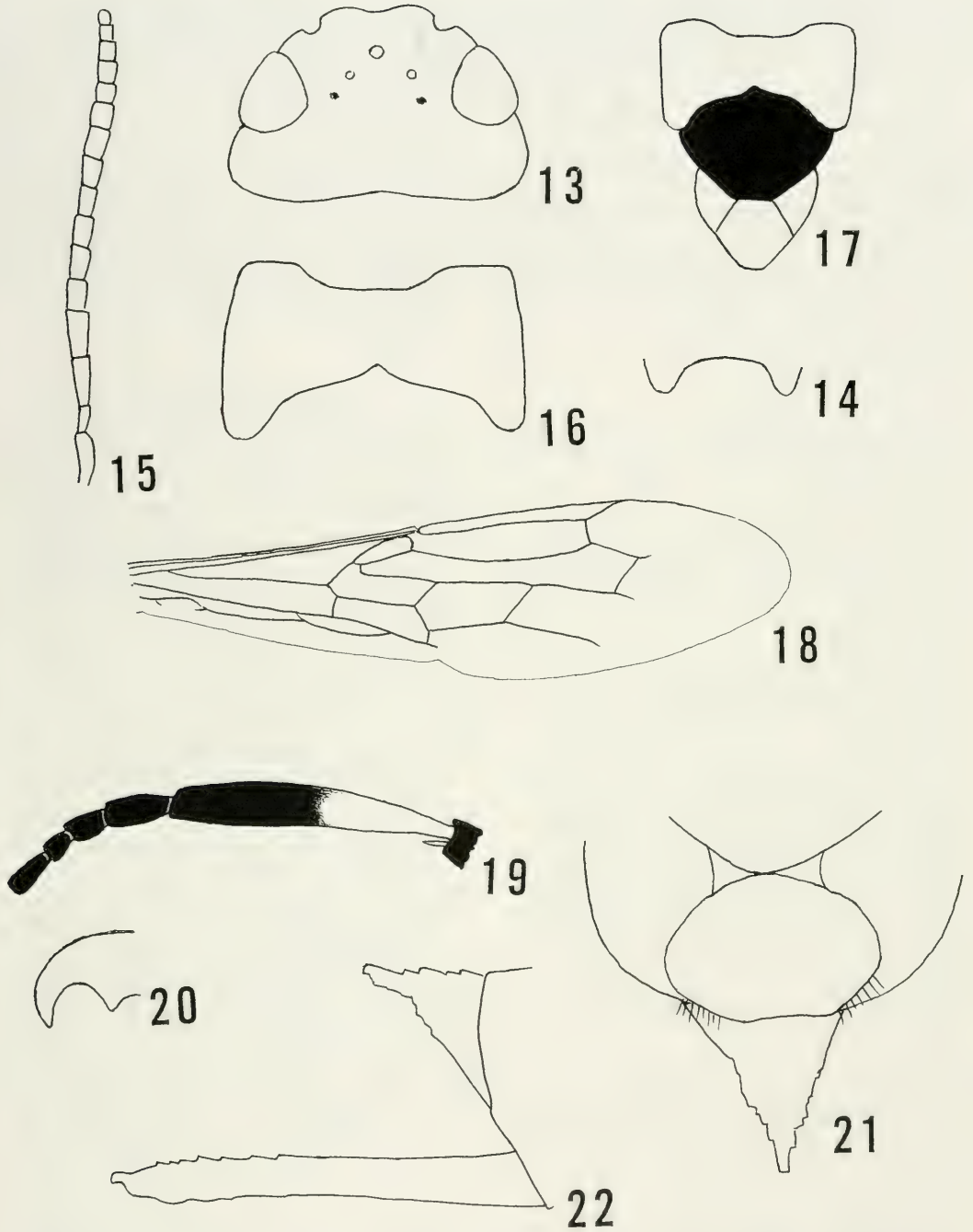


Fig. 12. *Tremex kurokivorus*, holotype, lateral view.

with following reddish brown to reddish yellow: pronotum, lobes of mesoscutum, mesoscutellum, metascutum (Fig. 17), and postscutum. Wings yellowish hyaline, median cell and radial cell of forewing dark brown (Fig. 12), outer side of fore- and hind wings dark brown (Fig. 12), stigma and veins yellow. Legs reddish brown with following black: coxae, hind femur, and apical 4 tarsal segments; basal half of hind tibia and basal $\frac{1}{2}$ of hind basitarsus yellowish white. Abdomen black with following yellow: triangular macula on basal portion of 1st tergite, basal $\frac{2}{3}$ of 2nd tergite, lateral side of 3rd to 7th tergites (Fig. 12), and basal $\frac{1}{3}$ of 8th tergite (Fig. 12); median portion of 9th tergite, precornal basin, cornus, and sheath reddish brown (Fig. 12).

Head: Rather triangular (Fig. 13); interocellar, postocellar, and lateral furrows indistinct; OOL:POL:OCL = 0.8:1.0:2.2; postocellar area slightly raised; frontal area nearly flat; distance between antennal sockets longer than antenno-ocular distance (ratio about 4.3:1.0); anterior margin of clypeus emarginate (Fig. 14). Antenna 16-segmented (Fig. 15), nearly as long as costa of forewing (ratio about 1.0:1.0); 3rd antennal segment nearly as long as 4th.

Thorax: Pronotum short, its mid-length shorter than OCL (ratio about 1.0:1.4). Venation of forewing as in Fig. 18. Legs with hind tibia nearly as long as hind basitarsus; hind basitarsus longer than following 4 tarsal segments combined (ratio about 1.0:0.7); tarsal claw as in Fig. 20.



Figs. 13–22. *Tremex kurokivorus*, holotype. 13, Head, dorsal view. 14, Clypeus, front view. 15, Antenna, lateral view. 16, Pronotum, dorsal view. 17, Mesonotum, dorsal view. 18, Forewing. 19, Hind tarsus, lateral view. 20, Tarsal claw, lateral view. 21, Precornal basin and cornus, dorsal view. 22, Cornus and sheath, lateral view.

Abdomen: Eighth tergite slightly longer than three preceding tergites combined (ratio about 1.1:1.0); precornal basin broader than long (ratio about 1.5:1.0) (Fig. 21); cornus as in Figs. 21, 22; sheath shorter than basal plate (ratio about 1.0:1.5), apical portion with serrate projection (Fig. 22).

Punctuation: Head and thorax distinctly, closely, and reticulately sculptured; underside of 9th tergite distinctly, closely, and reticulately punctured; 1st to last tergites except for underside of 9th tergite shagreened.

Male.—Unknown.

Food plant.—*Symplocos lucida nakaharai* Makimo (Japanese name, Kuroki) (Dicotyledoneae: Symplocaceae).

Distribution.—Japan (Okinoerabujima, Kagoshima Prefecture, Kyushu).

Holotype.—Female, 3.VIII.2004, emerged from timber of *Symplocos lucida nakaharai*, Mt. Ohyama, Okinoerabujima, Kagoshima Prefecture, Kyushu, Japan; H. Makihara leg. Deposited in the National Science Museum (Nat. Hist.), Tokyo.

Etymology.—The species name is from the Japanese name for the host plant, plus the Latin “*vorus*” or feeder.

Remarks.—This species can be separated from other Japanese species of *Tremex* by the preceding key. It is similar to *T. nigrocephalus* Lee and Chung (Lee et al. 1998) but *T. kurokivorus* can be distinguished by the reddish brown antenna (black with apical 3–4 segments brown in *T. nigrocephalus*). *Tremex kurokivorus* does not key in Maa (1949), and is unlike the known Chinese species (Xiao and Wu 1983).

Tremex kurokivorus is similar to *T. okinawensis* (see preceding key and Togashi 1997), but it is distinguished by the black scutum (with yellow U-like macula in *T. okinawensis*), but the black fore- and midcoxae (yellow in *T. okinawensis*), by the reddish-brown band on the median portion of the 9th tergite (with a yellow band in *T. okinawensis*), and by the form of the precornal basin (more triangular with the ratio between the breadth and length 1.3:1.0 in *T. okinawensis*).

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